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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/713,069	11/17/2003	Kia Silverbrook	ZG111US	9921
24011	7590	07/28/2004	EXAMINER	
SILVERBROOK RESEARCH PTY LTD 393 DARLING STREET BALMAIN, 2041 AUSTRALIA			GORDON, RAQUEL YVETTE	
			ART UNIT	PAPER NUMBER
			2853	

DATE MAILED: 07/28/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/713,069

Applicant(s)

SILVERBROOK, KIA

Examiner

Raquel Y. Gordon

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 11/17/2003 (this application).
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) _____ is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-4 and 7 is/are rejected.
- 7) ☒ Claim(s) 5 and 6 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 17 November 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☒ Certified copies of the priority documents have been received in Application No. 307330 10/129,503.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 11/17/2003.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

Double Patenting

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 1-6 and 8 are provisionally rejected under the judicially created doctrine of double patenting over claims 1-6 and 9 of copending Application No. 10/713093. This is a provisional double patenting rejection since the conflicting claims have not yet been patented.

The subject matter claimed in the instant application is fully disclosed in the referenced copending application and would be covered by any patent granted on that copending application since the referenced copending application and the instant application are claiming common subject matter, as follows:

1. A micro-electromechanical device that comprises
a substrate that incorporates drive circuitry (claim 1);
an elongate drive member, the drive member being fast with the substrate at a fixed end and incorporating an electrical circuit that is in electrical contact with the drive circuitry to receive an electrical signal from the drive circuitry, the drive member being

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configured so that a free end is displaced relative to the substrate on receipt of the electrical signal (claim 1);

motion-transmitting member that is fast with the free end of the drive member so that the motion-transmitting member is displaced together with the free end (claim 1);

and a working member that is fast with the motion-transmitting member to be displaced together with the motion-transmitting member to perform work (claim 1);

2. A micro-electromechanical device as claimed in claim 1, in which the motion-transmitting member defines a first class lever and has an effort formation that is fast with the free end of the drive member, a load formation that is fast with the working member and a fulcrum formation that is fast with the substrate, the effort and load formations being pivotal with respect to the fulcrum formation. (claim 7/6/2/1);

3. A micro-electromechanical device as claimed in claim 1, in which the drive member is a thermal bend actuator of the type that uses differential thermal expansion to achieve displacement (claim 3);

4. A micro-electromechanical device as claimed in claim 3, in which the thermal bend actuator is of a conductive material that is capable of thermal expansion and has an active portion and a passive portion, the active portion defining the electrical circuit, in the form of a heating circuit, so that the active portion is heated and expands relative to the passive portion on receipt of the electrical signal to generate displacement of the

actuator in one direction and termination of the signal results in contraction of the active portion to generate displacement of the actuator in an opposite direction (claim 4);

5. A micro-electromechanical device as claimed in claim 4, in which the conductive material of the actuator is resiliently flexible to facilitate said displacement of the actuator in the opposite direction (claim 5);

6. A micro-electromechanical device as claimed in claim 1, in which the drive member and the working member are of the same material, while the motion-transmitting member is of a different material to that of the drive member and the working member (claim 6);

8. A micro-electromechanical device that comprises

a substrate that incorporates drive circuitry (claim 1);

a plurality of elongate drive members, each drive member being fast with the substrate at a fixed end and incorporating an electrical circuit that is in electrical contact with the drive circuitry to receive an electrical signal from the drive circuitry, the drive member being configured so that a free end is displaced relative to the substrate on receipt of the electrical signal (claim 9/1);

a plurality of motion-transmitting members fast with respective free ends of the drive members so that each motion-transmitting member is displaced together with its associated free end (claim 9/1);

and a plurality of working members fast with respective motion-transmitting members so that each working member is displaced together with its associated motion-transmitting member to perform work (claim 9/1).

Furthermore, there is no apparent reason why applicant would be prevented from presenting claims corresponding to those of the instant application in the other copending application. See *In re Schneller*, 397 F.2d 350, 158 USPQ 210 (CCPA 1968). See also MPEP § 804.

Allowable Subject Matter

Claim 7 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Reasons for Indication of Allowable Subject Matter

The following is a statement of reasons for the indication of allowable subject matter. The following claimed combination is not taught by the prior art of record:

7. A micro-electromechanical device as claimed in claim 6, in which the drive member and the working member are both of titanium nitride.

Contact Information

Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Raquel Y. Gordon, whose telephone number is (703) 308-0022. The Examiner can normally be reached on M Tu Th and F 8:30-6:00. Effective February 11, 2003, Ex. Gordon, can be reached at the new PTO facility at (571) 272-2145.

If attempts to reach the examiner by telephone are unsuccessful, the Examiner's supervisor, Stephen Meier can be reached on 703-308-4896. Effective February 11, 2003, the supervisor can be reached at the new PTO facility at (571) 272-2149. The fax phone number for the organization where this application or proceeding is assigned is (703) 305-3432. A new fax number will be forthcoming.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956. A new status inquiry number will be forthcoming.

Raquel Y. Gordon
Primary Examiner
Art Unit 2853
July 23, 2004

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Double Patenting

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 1-7 are provisionally rejected under the judicially created doctrine of double patenting over claims 1-8 of copending Application No. 10/713069. This is a provisional double patenting rejection since the conflicting claims have not yet been patented.

The subject matter claimed in the instant application is fully disclosed in the referenced copending application and would be covered by any patent granted on that copending application since the referenced copending application and the instant application are claiming common subject matter, as follows:

1. A micro-electromechanical fluid ejection device that comprises

a substrate that incorporates drive circuitry; a fluid inlet channel defined through the substrate (claim 1);

a static nozzle chamber structure that is positioned on the substrate to extend from the substrate and that defines a static wall that bounds the fluid inlet channel to form part of a nozzle chamber (claim 8);

an active nozzle chamber structure that has a roof wall that defines a fluid ejection port and an active wall that depends from the roof wall about the static wall, to define a remaining part of the nozzle chamber, the active structure being displaceable with respect to the static structure towards and away from the substrate respectively to reduce and increase a volume of the nozzle chamber so that fluid in the nozzle chamber is ejected from the fluid ejection port (claim 1);

a fluid displacement member that is positioned on the static wall to define a fluid displacement area that faces the roof wall to facilitate ejection of fluid from the fluid ejection port (claim 4/3/1);

at least two actuators that are connected to the drive circuitry and operatively arranged with respect to the active structure to displace the active structure towards and away from the substrate on receipt of an actuating electrical signal from the drive circuitry (claim 1);

and a coupling structure that is interposed between each actuator and the active structure, the coupling structures being configured and connected to the active structure to impart substantially rectilinear movement to the active structure on operation of the actuators (claim 7/6/5/1);.

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2. A fluid ejection device as claimed in claim 1, which includes a pair of substantially identical actuators that are positioned on respective, opposite sides of the active structure (claim 5/3/1);

3. A fluid ejection device as claimed in claim 1, in which each actuator is a thermal bend actuator that is anchored to the substrate at one end to be in electrical contact with the drive circuitry and movable with respect to the substrate at an opposite end on receipt of an electrical signal from the drive circuitry (claims 6/5/3/1);

4. A fluid ejection device as claimed in claim 3, in which each actuator includes an elongate actuator arm that is anchored at a fixed end to the substrate and is connected to the drive circuitry, each actuator arm being of an electrically conductive material and having an active portion that defines a heating circuit that is in electrical contact with the drive circuitry to heat and expand on receipt of an electrical signal from the drive circuitry and to cool and contract on termination of that signal and a passive portion that is spaced from the active portion relative to the substrate so that the actuator arm bends and straightens as a result of differential thermal expansion and contraction and an opposed moving end undergoes reciprocal arcuate movement, the actuator arms being oriented with the moving ends aligned and facing each other, the coupling structures being interposed between respective actuator arms and the active structure and being configured so that said arcuate movement is translated into substantially

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rectilinear movement of the active structure (claim 7);

7. A fluid ejection device as claimed in claim 1, which includes two pairs of substantially identical actuators, the actuators of each pair positioned on respective opposite sides of the active structure (claim 5/3/1).

Furthermore, there is no apparent reason why applicant would be prevented from presenting claims corresponding to those of the instant application in the other copending application. See *In re Schneller*, 397 F.2d 350, 158 USPQ 210 (CCPA 1968). See also MPEP § 804.

Allowable Subject Matter

Claims 5 and 6 objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Reasons for Indication of Allowable Subject Matter

The following is a statement of reasons for the indication of allowable subject matter. The following claimed combination is not taught by the prior art of record:

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5. A fluid ejection device as claimed in claim 1, in which the static structure has an inner portion and an outer portion that together define the static wall, an inwardly directed ledge being positioned on a free end of the inner portion and an outwardly directed sealing formation being positioned on a free end of the outer portion so that the ledge and the sealing formation define the fluid displacement member.

6. A fluid ejection device as claimed in claim 5, in which the sealing formation includes a re-entrant portion that opens towards the substrate and a lip that is positioned on the re-entrant portion to extend outwardly therefrom, the lip and a free edge of the active wall being shaped and positioned with respect to each other so that when the nozzle chamber is filled with a liquid, the lip and said free edge define anchor points for a meniscus, so that the meniscus can define a fluidic seal to inhibit leakage of the liquid from the nozzle chamber during operation.

Contact Information

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Raquel Y. Gordon
Primary Examiner
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July 23, 2004

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PRIMARY EXAMINER**